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ABSTRACT

The adequate way to discuss problems of vocational education more generally is that taken by Resnick (1987). She feels that the relationship between general and vocational education, and their respective and common aims, problems, and restrictions, must be outlined primarily substantially and not only organizationally. Resnick tries to combine the political and organizational problems with research results from cognitive psychology and teaching-learning research. The Federal Republic of Germany has met the problem of vocational education through the dual system in which secondary students spend 3-4 days per week at a worksite and 1-2 days in a part-time school. The system does have its drawbacks, however. The problems can be classified in three steps: problems at the entrance into the system, problems within the system, and problems at the exit. Institutional recommendations to solve these problems include the need for government, local authorities, trade unions, and employers to agree to a solution and the requirement that vocational education be an independent part of the compulsory educational system. Content-oriented recommendations include the development of new interdisciplinary research strategies to reform vocational education in its content area. (YLB)

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Frank Achtenhagen

Learning in School and Out - General vs. vocational education

Paper presented at the AERA Annual Meeting,
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Frank Achtenhagen

Learning in School and Out - General vs. vocational education

I

The Centennial Exposition in 1876 in Philadelphia marked the close of the first century after the signing of the Declaration of Independence. Franz REULEAUX, later Rector Magnificus of the Technical University of Berlin, told of sharp criticism of Germany's industrial products. The Americans considered them shoddy, and lacking in design quality. Moreover, German products were said to smack of jingoism.

One year later, 1877, Karl BÜCHER, a prominent economist, published a harsh critique of the German vocational education system. Further, he compared the German with the French system, giving a final warning with a quotation from a French deputy: "Although certain nations surpassed us by introducing the compulsory and gratis elementary school, we now revenge ourselves; for the vocational training of our neighbours leaves a lot to be desired".

You see that sputnik-like phenomena always found and still spur the discussion on educational reform. At the moment, some educators and policymakers in the U.S. are calling for education reform on similar grounds. With the possibility of introducing vocational education at the elementary school level in the Soviet Union, last year in Washington I heard the following statement: "If the Soviet economy does prosper and challenge the U.S. economy, perhaps there would be an outcry in the United States for an educational system more like the Soviet system ... If this should happen, it would be vocational education (rather than science and mathematics) which would be given resources and status to respond to the challenge" (PLIHAL 1987, p. 12/13).

For Germany, two facts stimulated discussions of vocational education: (a) the comparison of industrial products, and (b) the danger of lagging far behind other industrial nations, especially France. Dramatic formulations, conjuring up the end of the world, had the desired effects. In publications on the history of German vocational education no doubt is left that especially these two reasons triggered off all changes in vocational education until 1920. Therefore, I was thrilled to find - during my preparations of this talk - an American report on the Philadelphia fair of 1876 and the consequences drawn for the U.S. According to HAWKINS/PROSSER/WRIGHT (1962), the German exhibit awakened the Americans: "The industrial and educational exhibit of the German Government made a profound impression ... Charts and graphs revealed the victories which products of German workshops had won in the markets of the world ... Visitors ... were amazed at the educational development ... in German schools" (p. 13). Especially impressive were the drawing schools. The authors discuss the alteration of American schools: The modernized German vocational education led to new structures; the technical progress stimulated the development of new courses in which the modern technologies could be taught. Without such courses, vocational education will be late, and the workers who are required to adapt themselves to the demands of constantly changing occupations would have no chance to be prepared for higher requirements. These qualifications, according to HAWKINS/PROSSER/WRIGHT, could not "be met by the pickup method, but only by organized instruction direct in its aims and methods, and opportune in its emergency service. This applies to training, operations on the job, and to classroom service ... The considerations explain why the traditional four-year apprenticeship courses so confidently offered by trade school in the past have virtually become obsolete " (HAWKINS/PROSSER/WRIGHT 1962, p. 15/16).

This was the American ex post facto explanation of how systematic apprenticeships for the broad American population disappeared. If there is - in fact - a connection between the Philadelphia fair and the American and German evaluation of vocational education, the same exhibition led to two different conclusions and actions. Germany - motivated by the "Letters from Philadelphia" - rearranged its vocational education according to the model of medieval apprenticeship, whereas the Americans largely abandoned apprenticeship for general education. In short, based on the same evaluation - that vocational education was in trouble -, the two countries moved in opposite directions.

I cannot outline here the complex conditions under which this happened. But one can say that the process of establishing the so-called "dual system" of vocational education was practically finished when in 1901 Georg KERSCHENSTEINER won the award of the Erfurt Academy. He answered the question: "What is the most suitable way to educate our male youth for the bourgeois society in the time between elementary school and compulsory military service?" And his answer was very simple: "By vocational education!" He developed his theory out of his practical experiences in establishing a system of apprenticeship in an enterprise or craftman's workshop and simultaneously in a vocational part-time school. Therefore, the German vocational education system is called the "dual system". Three points should be particularly stressed. KERSCHENSTEINER objected strongly

(1) to the unreflected fitting of young people to certain job requirements, and

(2) to the statement that vocational education has to follow a "finished" general education.

(3) He emphasized the importance of vocational education for a democratic and just community and saw the striving for satisfaction in one's work as but part of civic education to serve one's community.

His system was admired, and Munich became the Mecca of vocational educationists all over the world. In 1913, for instance, the U. S. Bureau of Education published a "Comparison of Public Education in Germany and in the United States", written by him. KERSCHENSTEINER changed his theory several times (cf. WEHLE 1964). From 1907 he incorporated the work of John DEWEY into his theory in response to objections of his theory. However, in 1917, a German doctoral thesis stated boldly that KERSCHENSTEINER borrowed his theory from DEWEY (cf. PRANTL 1917; cf. also WILHELM 1957). Thus, we can show a second paradox: The German discussion on vocational education used DEWEY's theory for founding its vocational educational system, while in the U.S. DEWEY's theory was used for establishing a comprehensive system of high schools without a strong branch of vocational education.

These fascinating paradoxa demonstrate that all organizational solutions are embedded in a complex social, political, economic, and ideological surrounding field. From these developments and pictures whose lines, surely, were overemphasized I draw the conclusion that the adequate way to discuss problems of vocational education more generally is that taken by RESNICK 1987. The relationship between general and vocational education, its respective and common aims, problems, restrictions must be outlined primarily substantially and not only organizationally.

In the next sections I outline RESNICK's most important arguments for the discussion of general and vocational education - according to my interpretation (II). Then I briefly describe the German structure of vocational education (III), followed by a discussion of some main problems we are confronted with (IV). Finally, I will try to show our scientific approach to tackle these problems (V).

II

I now come to my second paragraph - which is a very short - necessarily: too short - appreciation of Lauren RESNICK's very impressive considerations. While her constructive proposals open new horizons for vocational education, her analysis recalls - to me - the antique myth of King Midas who turned all things into gold when he touched them with his hands so that he finally starved to death. Similarily, school will turn practical life into mere symbols, and sensual, physical, social experiences into book-knowledge. She starts with an incisive analysis of "how school learning differs from other learning" (RESNICK 1987, p. 13 ff.); and this analysis flows in the questions "what role for schooling then?" and "what kind of schooling" (p. 16 ff.). She considers her questions from three points of view: "The role of schooling in directly preparing people for economic participation, its role in preparing people to learn effectively over the long course of their work lives, and its role in preparing people for civic and cultural participation" (p. 16). She brings her argumentation up to the point: "More effective forms of vocational and professional preparation than now exist are needed - forms more closely linked to job performance than those now customary. At the same time, there is a broadly enabling role that schooling can play with respect to the economy - a role of preparing people to be adaptive to the various settings they may encounter over the course of their working lives. Efforts to play this enabling function are likely to result in new forms of schooling that are also our best hope of preparing the next generation to participate knowledgeably and effectively in the civic functions of a technologically complex democratic society" (p. 16).

The point I would like to stress is that RESNICK tries to combine the political and organizational problems with research results from cognitive psychology and teaching-learning research. She identifies three key features of how learning and thinking skills are acquired: "First, most of the effective programs have features characteristic of out-of-school cognitive performances. They involve socially shared intellectual work, and they are organized around joint accomplishment of tasks, so that elements of the skill take on meaning in the context of the whole. Second, many of the programs have elements of apprenticeship. That is, they make usually hidden processes overt, and they encourage student observation and commentary. They also allow skill to build up bit by bit, yet permit participation even for the relatively unskilled, often as a result of the social sharing of tasks. Finally, the most successful programs are organized around particular bodies of knowledge and interpretation - subject matters, if you will - rather than general abilities. The treatment of the subject matter is tailored to engage students in processes of meaning construction and interpretation ... that can block the symbol-detached-from-referent thinking that (she has noted) is a major problem in school. Just such self-conscious meaning construction and interpretation skills are likely to be needed in conditions of breakdown and transition outside school, when one must use powers of reflection and analysis to craft sensible responses to new situations" (p. 18/19).

I chose this long quotation as an example of radical and simultaneously individuum-linked thinking. I judge the view of problems and the approach of solving problems of vocational education as a possibility and chance to reconsider and to reconstruct the urgent and unsolved problems in a new, unconventional, and promising way.

This seems to be extremely necessary, for the debate on problems of general and vocational education is

overshadowed by primarily organizational, administrative, financial, regional problems and - maybe most important - by problems of status. The discussions on Re-Visioning Vocational Education in the Secondary School - unleashed by the Minnesota Research and Development Center for Vocational Education (1986) - or the National Assessment of Vocational Education by the U.S. Department of Education (1986) - unleashed by the Perkins Vocational Education Act of 1984 - can quote as object lessons. But that is understandable, for the aggravating complaints of neglecting the problems and necessities of vocational education should and must be solved quickly and adequatly. Once more: I am convinced that the vision together with the research-based constructive recommendations of Professcr RESNICK will give us a chance to tackle the problems effectively.

III

By my third step I describe in short our actual German solution of the problem of vocational education. I do this with the purpose to demonstrate that we also are confronted with the problems Professor RESNICK pointed out. I also do that with the strong opinion that the difference in the political and organizational solutions and the discovery of things in common may help to find conclusions which fit the requirements of the society and the chances of human development.

I believe that a comparison may be helpful, for the German system of vocational education is accepted more and more in Western and Eastern Europe, but also in the expanding areas of Asia.

In the Federal Republic of Germany, the organization of the compulsory education consists of nine years of full-time education and three years of vocational education in the form of the "dual system" - that means 4 - 3 days per week in a worksite and 1 - 2 days in a part-time school (Berufsschule). About 75 % of all Germans absolve this program in one of about 400 official apprenticeships. This figure includes those who work without apprenticeship but visit the Berufsschule. The visit of the Gymnasium (13 years of school) which directly leads to the universities exempts from the compulsory educational program.

To enter the "dual system", one only needs nine years in elementary school and in one of the three school-types on the Secondary level I. Recent figures show the educational background of the about two millions of participants of the "dual system" who have a double status: they are, at the same time, both apprentices and students (Der BUNDESMINISTER FÜR BILDUNG UND WISSENSCHAFT 1987):

Educational background	% in 1986
9 years without graduation	1,5
Hauptschul-graduation (9 years)	29,9
Realschul-graduation (10 years)	36,1
Gymnasium-graduation: Abitur (13 years)	15,1
Vocational full-time school + at least Hauptschul-graduation	17,3
	99,9

The distribution over branches shows the following:

Type of apprenticeship	% in 1986
technical	51
commercial	42
agricultural	3
social work/home economics	4
mining	1
	101

In order to enter the "dual system", a youth must find an enterprise (in a wide sense) which is willing and authorized to provide training for apprentices in the occupation he wishes to pursue. There are different ways of finding: advertising of firms, personal relationships, governmental employment offices, short, but systematic practical training within the school on Secondary level I etc.

Firms build up a reputation of good apprenticeship; sometimes it is part of their enterprise-image. Those firms can and do select applicants for the apprenticeship they offer by evaluating school grades, test results, and personal impression. If an applicant has been accepted, then he and his parents on one side and the firm on the other sign an apprenticeship contract, which is largely standardized throughout the Federal Republic. By this contract, the firms commit themselves to teach all things that are necessary for the chosen vocation. The apprentice must commit himself to learn and to conduct well and to attend the vocational part-time school. The contract also covers remuneration, vacation and other things negotiated by the trade unions and employers' associations.

In the apprenticeship, the youth is trained for a specific occupation. The skills and knowledge for each of the about 400 apprenticeships which have to be taught in the enterprise are determined by the Federal Institute for

Vocational Training. This institute collaborates with the employers' associations and the trade unions. The training directives are issued by the Federal Minister of Education and Science (Bundesminister für Bildung und Wissenschaft) and guide the education in the enterprises. The directives also contain the content of the training, recommendations to segment the content, to teach and to examine. These directives are highly standardized.

The occupational character of vocational training in the Federal Republic is the reflection of the occupational organization of work there. Occupations or vocations are the fundamental building blocks of work organization. This is possible because the methods of Taylorism, that means the decomposition of labor processes into very small units, have not yet seized upon the industrial organization of labor in the Federal Republic to the same extent as in the U.S. Consequently, the certificate of an examined apprentice who then is officially called journeyman or clerk with the correpondent specification (e.g.: Malergeselle: Journeyman of (house) painting; Bankkaufmann: bank clerk) is an essential prerequisite for access to more privileged jobs. If an examined journeyman or clerk works in his occupation, then he must get a minimum salary fixed by the trade unions and employers' associations.

As I said, the coordination of the vocational education in the firms take place by the Federal Government, whereas the eleven Länder, the German states, are responsible for the organization and the curricula of the Berufsschule, the vocational part-time school. There are, naturally, commissions and institutions which harmonize and synchronize the work to be done in enterprises and schools. The examinations at the end of the apprenticeship are run nationwide and controlled by the autonomous and self-administrative chambers of commerce and industry or comparable chambers.

In the U.S. papers on revisioning the vocational education the status problem is very crucial. In Germany, an apprenticeship is highly estimated, especially, if the vocation is of high prestige. An Abiturient, a graduate of the Gymnasium, gets congratulations if he absolves an apprenticeship before his university studies. For some universitarian subjects an apprenticeship is needed for admission. The teachers of vocational education are the best paid German teachers; they earn the same money as judges at lower courts. The districts and towns which run the schools are very proud of their vocational schools and try to keep them on a high technical standard.

IV

I would like to stop here and to outline in my fourth paragraph some main problems of our vocational educational system we are confronted with. I am convinced that our system is a reasonable one. But I am also convinced that we have to develop it further. For that purpose, it is necessary to mark the drawbacks of the system. I classify the problems by three steps:
(1) problems at the entrance into the system;
(2) problems within the system;
(3) problems at the way out.

ad (1): Entrance problems

The German vocational educational system of apprenticeship is regulated by supply and demand in the market of training opportunities. The supply of apprenticeships is, therefore, dependent upon the willingness of the individual enterprise. The boys and girls do not have a right to an apprenticeship nor do the firms have an obligation to provide such education. The efficiency of the system depends on different equilibria which can be lacking by economic, demographic, or regional reasons. For instance,

the cost-benefit relation can foster or stop willingness to train young people; the demographic bulge causes imbalance; the attractiveness of occupations changes. Although about 400 apprenticeships are authorized, only a limited number comes into consideration: In 1986, the ten mostly frequented apprenticeships are chosen by 36,9% of the boys, and - with different vocations - by 55,6% of the girls. For the 25 mostly frequented apprenticeships these figures are 63,2% for the boys and 80,6% for the girls. One can see that social and sex differences are alive. We assume that in reaction to the demographic development the market of apprenticeships will change in the next years from a demand-oriented into a supply-oriented. Our hope is that hereby the quantitative and the qualitative problems pass their danger point.

ad (2): Within problems

A first major problem is the practical coordination of the curricula and training plans of the firms and the school. The old ideal has been the so-called "climbing-on one vocation class" (aufsteigende Einberufsklasse). That means that all apprentices of one vocation who start in the same year are together over the three years in one class in the part-time vocational school and that they learn in a more theoretical way the things they do practically in the enterprises. This principle did not and does not work. Because the intimate linkage of working and learning in the firms and the differences between the firms it was and it is impossible to coordinate the programs. The curricula, therefore, only frame the apprenticeship; as the chambers of commerce and industry control the final examinations, they force by this instrument a certain homogeneity.

A second problem is the different status of technical change in the firms. As the apprentices are occupied in different firms with a different degree of modernization, the school has the task to harmonize the education. These problems are solved - with time-lags - by investitions in the vocational schools or in regional training centers.

A third problem is the increasing abstractness of working processes caused by the new technologies on the basis of microelectronics. In the field of commercial education, for instance, we can demonstrate at least three levels of abstractness: On the zero-level we observe concrete movements of goods and money. On the first level of abstractness, the information and accounting systems lay over the concrete procedures. On the second level, these lists are hidden in computer programs. Only the intake and the outcomes are visible, but not the data processing structures. These phenomena together with the rising costs and risks associated with training by participation in the modern production and administration processes lead to an insulation of vocational education in classrooms, training - corners etc.: the Midas-effect.

A fourth problem is the lack of up-grading by certificates within the "dual system". There are possibilities of up-grading within the very well developed vocational school system, but no chances to climb up within the general system. The up-grading in the vocational system also is based upon general subjects as German, mathematics, and English.

A fifth problem is formed by the external examinations. A multiple choice-oriented test system influences the cognitive level of teaching-learning processes by lowering them. The instruction disintegrates into an adequate level for discussing problems and a poor rote-learning as preparation for the nationwide tests.

ad (3): Way out problems

The most important question is whether the apprenticeship immediately leads to an adequate job for which the education and training have been representative. The answer must be read thus, normally, a good apprenticeship combined with a good final examination leads to an adequate job. Our unemployment problem is mainly a problem of unskilled and badly educated people.

Let me end this paragraph by a short résumé. I listed some gravamina which exist and have to be solved. We trust on the possibilities of a market-oriented system. The dependency of a surplus upon the factor labor - economicly spoken - is a very strong motive to save imbalances. As a nation without raw materials we are forced to earn money by the intake of well skilled workers and clerks. This - relatively simple - insight makes it possible that reform processes can work - unless the political conditions which frame vocational education are discussed controversely.

What kind of reform is in work? - Some of the critical points can be related to organizational and individual misbehavior. The public becomes quite aware of the misuse of duties. The chambers start controlling if there are complaints about the quality of apprenticeship, especially if the apprentices show bad examinations over the years. With smaller cohorts the students have the chance to choose between the firms - and competency will lead to higher quality. But these points deal with the institutional aspects of vocational education.

V

In my last paragraph I would like to discuss the problem of possible constructive solutions. I concentrate on two points, (a) an institutional, and (b) a content-oriented solution.

ad (a): Which institutional recommendations can be drawn?

I read a lot on the problems of how to introduce vocational education into the U.S. system of education. If one studies the proposals of the different institutions and groups, e.g. Federal Government, States, local authorities,

enterprises, trade unions, employers' associations, teachers, scientists, one gets the impression of a "plebiscite with completely reversed premises". I would not like to take upon myself the right to give recommendations to the U.S. educational policy. But I assume that two points are decisive and should be thoroughly proved on the institutional level:

(1) A solution must be agreed - at least on state level - by the government, local authorities, trade unions and employers' associations.

(2) Vocational education should be an independent part of the compulsory educational system and should have possibilities of out-of-school performances and elements of apprenticeship.

By my introduction I tried to show that the development of vocational education took different courses in the U.S. and in Germany - by using very similar theories. There seems to be a chance to adapt the educational system to new challenges.

ad (b): Which content-oriented recommendations can be drawn?

Here, I link with Professor RESNICK'S statements. Two of her key features were mentioned. The third deals with the hypothesis that "the most successful programs are organized around particular bodies of knowlegde and interpretation - subject matters... - rather than general abilities" (p. 18). According to the impact of new technologies and the problem of increasing abstractness, teaching-learning research is challenged. Let me demonstrate very shortly by what means we try to develop new interdisciplinary research strategies to reform vocational education in its content area. You can see that our planned procedures form a synthesis of German organizational conditions and didactic models with research approaches as they are being developed in the U.S., especially in Pittsburgh.

We are developing a program of research coordination in the field of teaching-learning processes within vocational education. One key category is that of the development of "mental models" (cf. GENTNER/STEVENS 1983). Under concentration on the subject matter aspect we try to combine coherently (cf. ACHTENHAGEN/JOHN/LÜDECKE/PREISS/SEEMANN/SEMBILL/TRAMM 1988):

(1) the content-related requirements of specific occupations;

(2) the scientific discussion on that point (e.g. a system approach in relation to a decision-oriented theory of business administration);

(3) the transposition of these two points into a so-called "idealistic thematic structure"; this means a operationalized formulation of aims and contents to be taught and learnt;

(4) the investigation of the preknowledge of students or apprentices in relation to the idealistic thematic structure;

(5) the transposition of the aims and contents into teaching-learning processes;

(6) the reconstruction of subject matter over time; we speak of the "thematic process structure";

(7) the control of the relationship between teaching-learning processes and learning outcomes;

(8) the conversion of learning outcomes into actions within the worksite.

The control of subject matter over all steps shall guarantee the coherence of this research program which is to be getting started in 1990. We try to find answers in direction to the following questions:

(a) What has to be said concerning the different possibilities and necessities of the introduction of new technologies into the different professions and branches?

(b) What has to be said concerning the mutual influence of vocational and recurrent education on the one hand, and professsional chances on the other?

(c) What has to be said concerning the evaluation of "breakdown"-phenomena which were discussed as problems of "key-qualifications"? What is the optimal relation of general and vocational education within the compulsory education?

The research shall be conducted in different learning places, in school and out, and encompass the development of vocational education which includes - according to DEWEY's ideals - the development of civic consciousness. Our hope is that this program may contribute a bit to the vision spread by Professor RESNICK.

Literature

I dispensed with an extense citation. I used to a large extent the translation proposals in the MAX-PLANCK-INSTITUTE-book which is written with great political engagement. Actual informations on the German discussion can be found in the journal "Zeitschrift für Berufs- und Wirtschaftspädagogik".

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